▲▼▲ WOODCOCK WASHBURN

INTELLECTUAL PROPERTY LAW
ATLANTA • PHILADELPHIA • SEATTLE

FACSIMILE

DATE: **June 23, 2008**   JOB CODE:
OFFICIAL PAPER

Please deliver this and the following pages to:

Examiner:	**Cam Truong**
U.S.P.T.O. Group Art Unit:	**2162**
Telecopier No.:	**1-571-273-4042**
U.S. Serial No.:	**11/244,021 and 10/692,350**
Client/Matter No.:	**MSFT-5450**
Sender's Name:	**Kenneth R. Eiferman**
Pages to Follow:	**6**

If transmission is not complete, please call our **Philadelphia Office at (215) 568-3100**.

COVER MESSAGE:

OFFICIAL FACSIMILE. PLEASE DELIVER TO EXAMINER IMMEDIATELY.

Attached hereto is/are the following documents:
1)
2)
3)

WOODCOCK WASHBURN LLP
A Partnership Including Professional Corporations
www.woodcock.com

11/244,021 Proposed Claim Amendments for discussion during June 24 Interview

1-14. (Cancelled)

15. (Currently Amended)   A computer-readable storage medium having stored thereon a data structure, comprising:

    a first data field containing an identifier that identifies a document;

    a second data field containing a document type value representing a document type associated with the document, the document type having a parent class and being part of a hierarchy of document types organized in a plurality of levels, the document type value for a particular document type being unique among all document types in a given level of the hierarchy; and

    a third data field containing a value representing a type path for the document type that shows a path from a root document type to the document type in the hierarchy of document types, the value being generated by appending the document type value representing the document type associated with the document to a value representing a type path of a parent class of the document type, wherein the value representing the type path is compressed by separating the document type value and the value representing the type path of the parent class of the document type by a reserved separator byte.

16. (Previously Presented)   The computer-readable storage medium of claim 15, wherein the document type is a user-defined type (UDT).

17. (Previously Presented)   The computer-readable storage medium of claim 15, wherein the document type can be a subtype of another document type.

18. (Cancelled)

19. (Previously Presented)   The computer-readable storage medium of claim 15, wherein the value representing the type path comprises a variable-length encoded value having a length that is uniform among document types having a same depth from the root document type.

20-24. (Cancelled)

25. (Currently Amended)   The computer-readable storage medium of claim 19 20, wherein the variable-length encoded value corresponds to a hierarchy level of the document type within the hierarchy of document types.

26. (Cancelled)

10/692,350 Proposed Claim Amendments for discussion during June 24 Interview

1. (Currently Amended) A computer system for processing a query, the computer system comprising:

a processor;

a memory;

a data store comprising a table of documents, each document having an associated document type in a hierarchy of document types, each document type being associated with a type path that is a path from a root document type to the document type in the hierarchy of document types and that is constructed as a function of the document type, the table comprising a plurality of entries representing the documents and their respective associated type paths, wherein at least one document type is a user-defined type (UDT) that is associated with a fixed-length type value and with a hierarchical type value generated by concatenating respective type values of types along the path from the root document type to the user-defined type in the hierarchy of document types, wherein the hierarchical type value is compressed by separating the concatenated type values by a reserved separator byte; and

a document retrieval system that accesses the table in the data store to determine, for each document, if its associated type path will satisfy the query, and generates query results comprising each type path that satisfies the query, wherein the document retrieval system determines is configured to determine, for each document, whether its associated type path contains one of a value specified by the query and a prefix of a value specified by the query.

2. (Previously Presented) The computer system of claim 1, wherein each document type is a user-defined type (UDT).

3. (Previously Presented) The computer system of claim 1, wherein a document type can be a subtype of another document type.

4. (Canceled)

5. (Currently Amended) The computer system of claim 1 [[4]], wherein the data store comprises a computed column for storing each type path.

6. (Currently Amended) The computer system of claim 1 [[4]], wherein each type path comprises a variable-length encoded value.

7. (Previously Presented) The computer system of claim 6, wherein each variable-length encoded value corresponds to a hierarchy level of the document type of the associated document.

8. (Canceled)

9. (Previously Presented) The computer system of claim 25, wherein each document type is a user-defined type (UDT).

10. (Previously Presented) The computer system of claim 25, wherein a document type can be a subtype of another type.

11. (Previously Presented) The computer system of claim 25, wherein each document has an associated type path.

12. (Previously Presented) The computer system of claim 11, wherein each type path belongs to a computed column in the table.

13. (Previously Presented) The computer system of claim 11, wherein each type path comprises a variable-length encoded value.

14. (Previously Presented) The computer system of claim 13, wherein each variable-length encoded value corresponds to a hierarchy level of the document type of the associated document.

15 – 24. (Canceled)

25. (Currently Amended) A computer system for processing a query, the computer system comprising:

a processor;

a memory;

a data store comprising a table of documents and associated pre-computed values, the pre-computed values comprising information to discern objects based on type pursuant to a hierarchical search, each document having an associated document type in a hierarchy of document types, the document type associated with a document being used to compute the pre-computed value associated with said each ~~that~~ document; and

a document retrieval system that accesses the table in the data store to determine, for each document, if the ~~its associated~~ pre-computed value associated with said each document will satisfy the query, and generates query results comprising each pre-computed value that satisfies the query, wherein the document retrieval system generates ~~is configured to generate~~ an estimate of the selectivity of the query at least in part by

creating a histogram over the pre-computed values, the histogram having a plurality of elements representing document types in a ~~the~~ hierarchy of document types, each element associated with a quantity of documents of the document type represented by said each ~~that~~ element,

encoding the query to describe one or more documents to retrieve based on an encoded query type,

for each element of the histogram, determining whether the encoded query type is a prefix of the document type represented by the element of the histogram,

for each element of the histogram for which the encoded query type is determined to be a prefix of the document type represented by the element of the histogram, adding the associated quantity to a sum of matching elements,

for each element of the histogram for which the encoded query type is determined not to be a prefix of the document type represented by the element of the histogram, adding the associated quantity to a sum of non-matching elements, and

generating the estimate of the selectivity of the query as a function of the sums of matching elements and non-matching elements.